



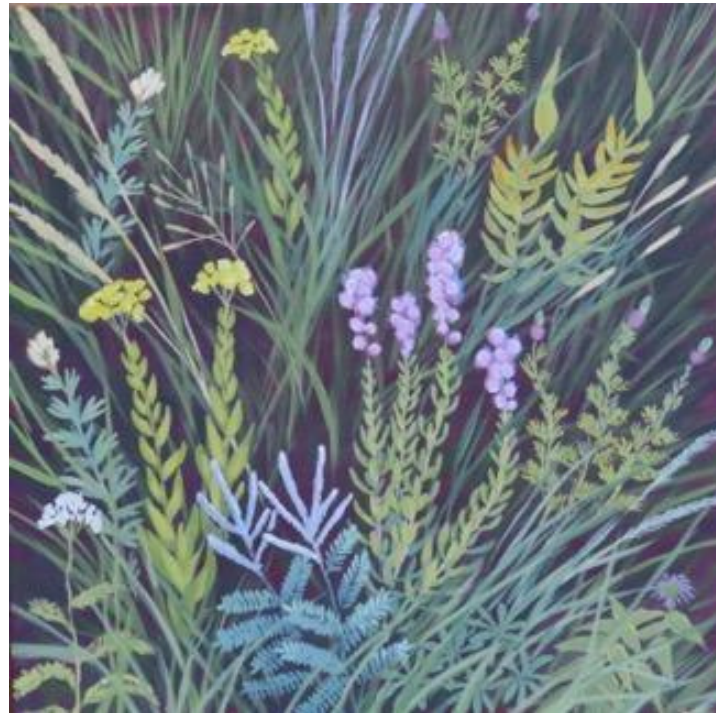
Field Notes

Cedar Creek's Quarterly Newsletter

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Portraits of Plots



painting by Don Luce

By artist in residence Don Luce

Life on Earth is amazingly diverse. For centuries, scientists have worked to catalog that diversity and understand how it came to be. They have also wondered how important diversity is for the functioning of living systems. In other words, what is biodiversity good for? The answer to this question is critical as human activities remove many species from large areas of the planet and drive many to extinction.

In the 1990s, a large-scale experiment at the Cedar Creek Ecosystem Science Reserve was

initiated to try to answer this question. The Big Bio experimental field involves over 300 plots, each 9x9 meters (about 30x30 feet). Each plot was planted with a selection of native prairie plants. Some plots were planted with just one species, some with two, four, eight and sixteen species. Each spring, the plots are burned, and in the summer, they are weeded to remove any plants that were not the designated species. Each year, the plots are sampled to determine how much biomass is produced. Carbon and nitrogen in the soil are measured, and other things like insect abundance and diversity are studied.

The results have shown that more diverse plots produce more biomass, and this productivity has increased over time. More diverse plots are also more stable, producing more during droughts, and are more resistant to invasion by weedy species. The Big Bio experiment demonstrates that biodiversity is important for the productivity and stability of living systems. (continued on page 6)



Notes from the Associate Director

It's spring! I started this note a few days ago, and am now worried that I jinxed things and brought on the March 31st snow! Hopefully this storm is it though - after the winter we've had, I think Cedar Creek's buildings and grounds team might quit en masse should we get another Tax Day blizzard like in 2018.

As the snow starts to melt, everyone at the Reserve is getting ready for the 2023 field season. We are onboarding new staff members and interns, assembling sampling schedules, welcoming synthesis working groups, repairing housing units, and approving new research projects. In the works as well are a brand-new website, updated safety documentation, a modernized housing management system and other behind-the-scenes changes to make life at the Reserve smoother and simpler. Exciting and energizing times around here!

With the warmer weather we're also excited to see more of you in person, for research, events, programs or whatever excuse brings you to East Bethel.

Sincerely,
Caitlin Barale Potter, Ph.D
612-301-2601, caitlin@umn.edu

Welcome, Lydia!

Lydia Winkler is Cedar Creek's new operations associate! You're most likely to find her in the front office in the Lindeman Research and Discovery Center, where she is already (after 1 week) handling housing requests, managing Cedar Creek's purchasing and finance tasks, answering visitor questions, and learning to onboard researchers, do HR work, and generally support all the various "operations" that make up Cedar Creek.

Lydia pursued a biology and environmental science degree at University of Minnesota Morris and got a taste of field station life during a summer internship at Itasca Biological Station. Post graduation, she worked as a laboratory coordinator for the University of Minnesota College of Pharmacy teaching lab. After spending several years providing administrative support to pharmacists, she is excited to combine her administrative skills with her interest in ecology and the environment. Outside of work, she enjoys reading science fiction and fantasy novels, traveling to new places with friends, and spending time with her two cats.



Peat Streams Field Survey

Although we often think of fieldwork - especially fieldwork involving streams! - as taking place during the warmer months of the year, an intrepid group of researchers from Texas Tech University and the University of Illinois visited Cedar Creek in the midst of our very snowy winter to deploy their instruments. Over the course of four days in early March (with daytime temperatures in the 30s and nighttime temps dropping below freezing), graduate students John Nelson and Shahrouz Azarmidokht used chest waders, snowshoes and a canoe to deploy equipment that measures stream velocity, water depth, water temperature, and floodplain conditions in Cedar Creek. Their instruments will collect this data repeatedly from now through July, and will provide important information about the spring snowmelt and other dynamics in our namesake water body. The research team, which also includes faculty members Dr. Jeffrey Nittrouer (Texas Tech) and Dr. Gary Parker (University of Illinois), will use this data as part of a larger project studying the geomorphology, hydrology and morphodynamics of Cedar Creek and peat streams generally.



A day in the life! Texas Tech grad student John Nelson works in deep mud to free the team's research canoe. The creek may not have been frozen, but neither was it ideal for boating!

Other images show the research team's camera which visually documents changes in stream height, and a pressure transducer and tilt meter to measure velocity, water depth, and other variables.

Bringing the Outside In

By Lance Janssen, College of Biological Science communications team

Cedar Creek Ecosystem Science Reserve is a world-renowned research station located a short drive away from the Twin Cities. But for middle and high school students sitting in science classrooms across the metro looking at microscopes or working at desks, the field station with its oak savannas, research field plots, bogs and creeks offers a very different approach to science.

“One thing I loved about bringing my students to Cedar Creek was that it exposed them to “other” types of scientific research,” says Sorcha Nix, teacher in the St. Paul Public School District. “Field research is the total opposite of the stereotypical idea of a scientist in a white lab coat holding beakers, and many of them hadn’t known about it before.”

Nix and Terry Doud, a teacher in ISD 197, both recently took part in *Research Experience for Teachers* (RET) at Cedar Creek, a program sponsored by the National Science Foundation. Through RET, educators can conduct research with faculty across the country and gain unique experiences and knowledge that can impact their work as teachers.

As part of the program, Nix and Doud helped with field experiments and wrote lesson plans that bring field research from Cedar Creek into the classroom, from decomposition to work on how nutrients impact ecosystems to climate change. During the school year, they ran a decomposition experiment at their schools, and brought students to Cedar Creek for field trips.

“I conducted research in the Nutrient Network plots at Cedar Creek, looking at connections between seed predation of granivores and nutrient deposition in the plots,” says Doud. “It interested me to actually conduct research and then be able to bring this knowledge and experience into the classroom.”



Terry Doud setting up his seed predation experiment.

Bringing the Outside In

For Nix, the chance to be part of the RET program helped her gain critical experience and time to focus her teaching efforts.

"I worked on creating curriculum that is centered around research being done at Cedar Creek," Nix says. "I was able to design, pilot and revise several multi-day lessons. They have and will benefit Terry's and my classes, and we're going to make them shareable so other educators can use them as well."



Sorcha Nix and two of her multi-day lessons.

While taking advantage of the opportunity to hone some of their teaching skills through RET, both Nix and Doud note the unique opportunity this program gave them in exposing their students to field biology. "Cedar Creek is incredibly unique with a number of ecosystems represented in one preserve in Minnesota," says Doud. "It is also home to NutNet and BioCON which are part of worldwide networks of science research. It is amazing for kids to be able to go to Cedar Creek and see these large-scale science experiments."



Students from Terry Doud and Sorcha Nix's classes on their decomposition-themed field trips to Cedar Creek.

Portraits of the Plots - The Biodiversity Experiment

(continued from page 1) These plots also vary dramatically in their appearance. Some plots are a tangle of vigorous growth while others are mostly bare ground. Some plots are in flower at only one point in the season, while others have some plants in blossom throughout the summer. Some plots have a very uniform look, while others are a rich and complex pattern of shapes, colors and textures. Over the 25 plus years that the experiment has been running, each plot seems to have developed its own history and personality. In this project, I have selected a series of nine plots, with different levels of diversity. I studied them from the perspective of an artist and a naturalist. I tried to capture, in a painting, the distinctive “portrait” of each plot, giving viewers an intimate perspective into each plot’s character, diversity and abundance. I also hope that my series of nine paintings will give viewers a window into the significance of the Big Bio experiment, one of the first studies to quantitatively demonstrate the importance of protecting our Earth’s amazing biological diversity.

My process:

I visited the experimental plots several times throughout the growing season. Late June, early and late August, and early October.

I photographed many plots. I learned to identify the sixteen plant species by sketching them. I observed the weeding and harvesting process and looked for a selection of plots at different diversity levels that were visually interesting. I toured the plots with David Tilman and Caitlin Potter to learn about the experimental process. I photographed details of the plots during early morning hours when shadows made the plants more distinct.

In the painting process- I tried to mimic the establishment and growth of the plots. The plots all started as bare sandy soil and are burned each spring to remove most of the above ground litter. To mimic this, I painted a sandy base color on all the canvases. I then started each painting by adding the color, texture and shadows of the ground surface on top of the sand-colored base. After this was in place, I would add the colors, patterns and details of the plants.



Portraits of the Plots - The Biodiversity Experiment

As “portraits,” I wanted the paintings to be close-up views of the plots. I wanted viewers to see the plots as if they were looking down on them at a slight angle – as if they were trying to identify the plants and maybe weed out species that were not supposed to be there. Though my depictions of the plants would be simplified and stylized, I still wanted them to be identifiable. This became more of a challenge as I worked on the more diverse plots. How was I to show all the species in plots that were a thick and complex tangle of vegetation. In these plots, the ground surface was almost entirely in shadow during the morning. On these canvases, I painted a purplish glaze over the sand-colored base. On top of this I painted dark green leaves, mostly grass blades, as the shadow layer of vegetation. Then I painted each of the species found in that plot. I took some liberties by combining plants that would normally flower at different times during the season. Though I painted each “portrait” individually, my intention was always to show them as a group, displayed in a 3x3 grid, reflecting the grid of the Big Bio experiment.

Come view Don's portraits in person!

Don will exhibit his portraits of the Big Bio experimental plots at the Bell Museum (2088 Larpenteur Ave W, St Paul, MN 55113) from May 19th through July 16th. The exhibit is free with museum admission!

Details are on the Bell Museum's Exhibits page at <https://www.bellmuseum.umn.edu/event/portraits-of-the-plots-biodiversity-at-cedar-creek-ecosystem-science-reserve-by-don-luce/>

Land Management - Garlic Mustard Pull

We are excited to partner with Anoka County to remove invasive species within Cedar Creek. On Tuesday, May 16, from 9:00 -11:00 AM, join us for a Garlic Mustard Pull to remove an invasive Garlic Mustard patch from the interior of Cedar Creek property. Bring yourself, bug spray, water bottle, long pants and hiking boots as we walk to the site from the main building, Lindeman Lab. Learn more about how to identify and remove garlic mustard. Tools, gardening gloves, and other supplies will be provided. If you'd like, bring a sack lunch and enjoy eating it out on the patio by Lineman Lab after the event.

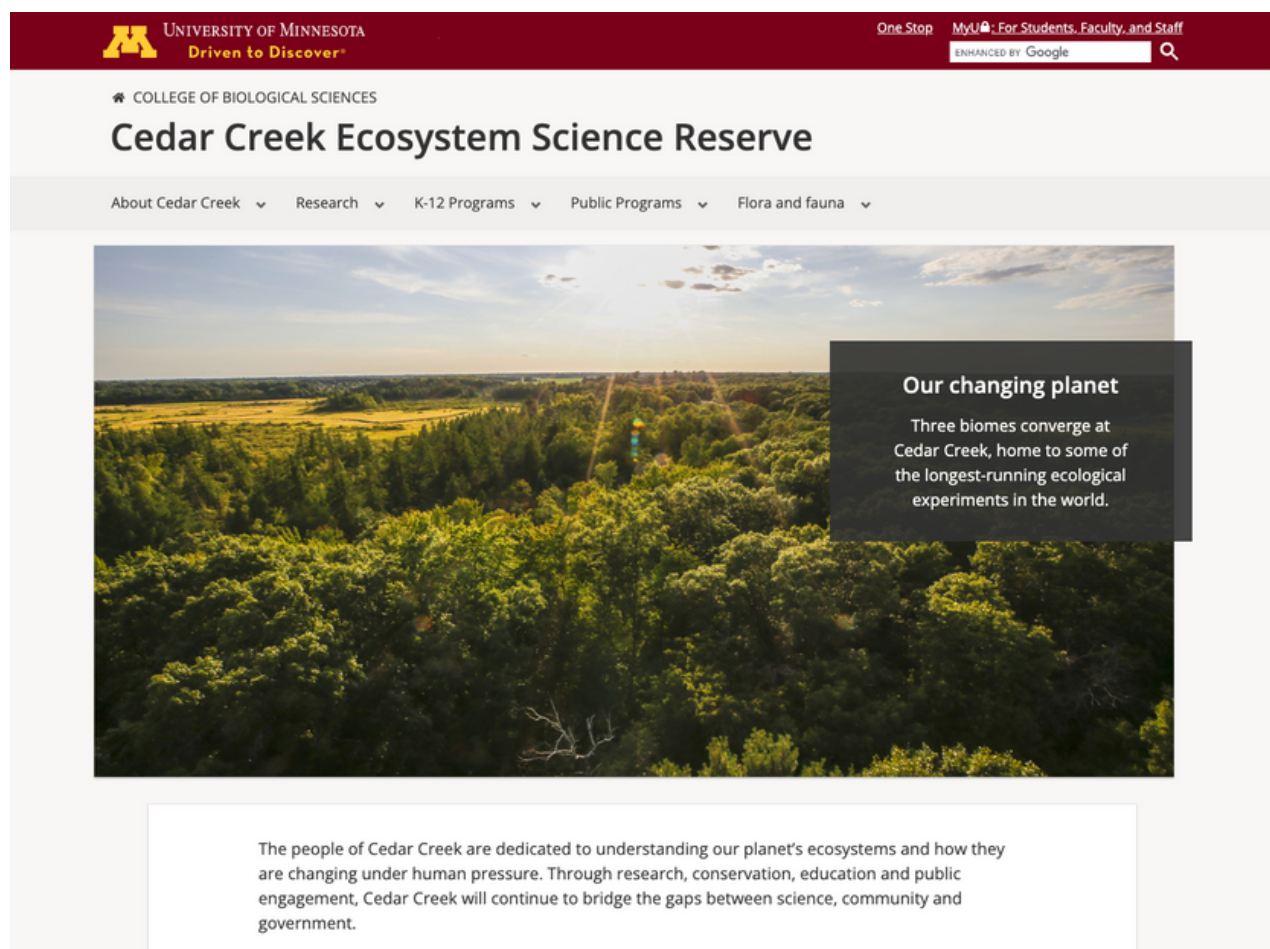
Stay Tuned for Upcoming Events!

We are always adding new programs and opportunities to engage at Cedar Creek. For the most up to date program information and finalized program schedules, please visit the upcoming programs page at <https://cbs.umn.edu/cedarcreek>.

New Website!

The Reserve has a new website! You can find us under the official University of Minnesota's College of Biological Sciences umbrella at <https://cbs.umn.edu/cedarcreek>! There are still some issues being worked out and content being added and updated, but we are excited for this opportunity to align with college branding and formatting, and to showcase our research, conservation, education and community engagement efforts in new ways.

Simultaneously, work is underway to build out and update a Cedar Creek Long-Term Ecological Research (CDR-LTER)-specific website, which will be found at the same URL as always - <https://www.cedarcreek.umn.edu/>. We hope that this separation will make it easier for LTER researchers and staff to handle LTER-specific data and communication requirements, while still providing ALL of our visitors with the information they need for a successful Cedar Creek experience - whether they are a student, a faculty member, a researcher, a program officer, or a community member!



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Cedar Creek Ecosystem Science Reserve

About Cedar Creek ▾ Research ▾ K-12 Programs ▾ Public Programs ▾ Flora and fauna ▾

Our changing planet

Three biomes converge at Cedar Creek, home to some of the longest-running ecological experiments in the world.

The people of Cedar Creek are dedicated to understanding our planet's ecosystems and how they are changing under human pressure. Through research, conservation, education and public engagement, Cedar Creek will continue to bridge the gaps between science, community and government.

Abandoned Farm Fields Take Decades to Recover Biodiversity—If They Can At All

By Emily Baron Cadloff, reprinted with permission from *Modern Farmer*

How much does agriculture impact our environment? A new study, published in the *Journal of Ecology*, shows that, even after 80 years, sites that had once been used for farming still had not bounced back to the levels of plant diversity and robustness they had before human intervention.

The study looked at 17 different grassland sites, along test plots at the Cedar Creek Ecosystem Science Reserve in Minnesota. Each of the grasslands had previously been plowed and used for farming, but they were abandoned as early as 1927 and as recently as 2015. Since then, the fields have been left to recover vegetation naturally.

The researchers, from universities in Minnesota, Michigan, California, Germany and Austria, compared these 17 sites to grasslands that had never been plowed. “What we wanted to know was how fast and how completely disturbed grasslands can regain their biodiversity if they are left to recover,” said researcher Emma Ladouceur in a news release. “Understanding that recovery process can give us insights into how we can assist and speed it up using restoration.”

The study notes that grasslands are one of the most endangered and least protected biomes in the world, with untouched areas increasingly encroached upon. There aren't many continuous tracts of grassland left, but they provide crucial functions for our environment. The plains help mitigate both flooding and droughts, protect against soil erosion, and provide habitat to thousands of animal species, including hundreds of pollinators. The UN Convention on Biological Diversity has even called for 30 percent of degraded land and water areas to be under “effective restoration” by 2030. As such, it's crucial to know how long it could take to recover previously developed grasslands. Put another way, how long would it take to undo the damage that humans can cause to a pristine landscape?

As it turns out, it takes a long time—possibly never, if the land was left alone. The research shows that, even after 80 years, none of the fields had recovered to the point of the never-plowed sites. On average, the previously farmed areas hosted only 65 percent of the species that the untouched areas did, and there were more than 60 unique plant species that grew on the untouched sites but never reappeared on the test plots.

Ultimately, this could mean that a solution for previous human intervention is...more human intervention. This time, however, humans would be there to offer a helping hand to speed up the restoration process. “Specific restoration measures could include the seeding or planting of species that we know are not part of the composition of recovering fields, combined with the management of exotic species to reduce competition with native species,” said Ladouceur.

2023 Star Parties



Drop in and look at stars and other astronomical features at Cedar Creek Star Parties! Star Parties are scheduled on Friday nights, with a backup date of Saturday, if the weather is better. Please check the Minnesota Astronomical Society Events page to stay up to date on if the Star Party is occurring on Friday or Saturday.

Each Star Party starts with a brief presentation about astronomy, read the program descriptions below for specific special topics around astronomy. If the weather permits, participants will have an opportunity to look through a number of telescopes outside Lindeman Lab. For more details about directions and parking visit <https://www.mnastro.org/venue/cedar-creek-ecosystem-science-reserve/>

April 28 - Spring Constellations - Star Party Program

Come and learn more about the night skies in Spring. Minnesota Astronomical Society members will walk you through the April skies. After the short presentation, a number of telescopes will be available for night sky viewing (weather dependent). Back-up date of April 29. Please check [mnastro.org/events/](https://www.mnastro.org/events/) for the latest news and updates.

May 12 - Star Party Program - What's up tonight?

Learn more about the night skies! Each star party starts with a brief presentation about astronomy. A number of telescopes will be available for night sky viewing after the program, weather dependent. Back-up date of May 13. Please check [mnastro.org/events/](https://www.mnastro.org/events/) for the latest news and updates.

Save the Dates: More star parties will be offered on **August 25, September 22, and October 20.**

Frequently asked questions:

Will the star party occur rain or shine?

- Star Parties will be rescheduled to Saturday if the weather looks favorable. Before attending a star party, check the Minnesota Astronomical Society website for the latest news and updates related to the weather. Star Parties will occur rain or shine with presentations focused on learning more about the night sky or other special astronomy topics.

Do I need a telescope to attend?

- No, telescopes are not needed to attend. Just an interest in stars and astronomy.

Do I need to register?

- Registration is not required to attend. Just show up at Cedar Creek and head toward the Lindeman Lab. For more details about directions and parking visit www.mnastro.org/events/.

Auroras at the Reserve!

In late March, a solar flare brought a truly magical moment to Cedar Creek - the northern lights or aurora borealis were visible right here at the reserve! Given how far south we are, this is a pretty unusual event. Plus, you need the right sky conditions - nighttime, no clouds, minimal light pollution, etc. It's not often that everything lines up so we were incredibly excited when they did! Neighbor **Brett Quiggle**, a professional photographer, captured these wonderful images on the reserve perimeter and kindly shared them with us.



Solar Viewing

Cedar Creek is excited to offer our first ever Solar Viewing Party in partnership with the Minnesota Astronomical Society! The event will occur at Cedar Creek on June 3rd from 1:00 - 3:00 pm. Come to Cedar Creek to learn more about the sun and its importance to plants and life on Planet Earth. After family-friendly activities, experienced Minnesota Astronomical Society Members will use special telescopes and telescope filters for safe solar viewing.*

June's program will focus on the sun's solar energy and its impacts on animals and potential uses by humans. Activities are geared toward ages 7+. Registration is required. To register visit Eventbrite - <https://www.eventbrite.com/e/solar-viewing-party-tickets-601510483047>

*NOTE: Looking directly at the sun without specialized equipment and filters can cause permanent eye damage.

Save the Date: We will host another Solar Viewing Party focused on Plants and Light on September 23 from 1:00 - 3:00 pm!

Soil Carbon as a "Gatekeeper" on the Nitrogen Cycle

By Gabriel De La Rosa, reprinted with permission from the Long-Term Ecological Research Network's March 2023 *Network News*

An LTER [Long-Term Ecological Research] cross site synthesis effort reveals that soil carbon availability determines nitrogen mineralization and nitrification rates across a wide diversity of terrestrial ecosystems.

Ecosystems across the globe are wildly different, from the Arctic tundra to midwestern grasslands to temperate northeastern forests. Yet a new paper shows that across fourteen varied terrestrial sites in the Long Term Ecological Research Network [including Cedar Creek!] the amount of soil carbon determines soil nitrogen biogeochemistry by shifting the balance between nitrification and nitrogen mineralization. The result is important for understanding the fate of nitrogen in ecosystems across the globe, and the link between carbon and nitrogen has implications for soil carbon storage and emission.

Dry, wet, cold, warm: soil carbon influences nitrogen across diverse sites

Finding a common pattern in soil biogeochemistry across ecosystem types seemed unlikely, says Dr. Allison Gill, lead author of the new paper published in *Biogeochemistry Letters*. Vastly different processes control nutrient transformations in boreal forests than in the desert. But, once she and coauthors started looking across ecosystems, they found that in soils with little available carbon, rates of nitrogen mineralization and nitrification were closely linked, but in soils with more available carbon, the two processes became uncoupled.

The sites, including fourteen terrestrial sites part of the LTER Network, cover a huge geographic range: the pattern held in Arctic sites, the Everglades, urban ecosystems, deserts in the Southwest, northeast forests and more. "I don't think anyone, ourselves included, would argue that the only thing controlling the relationship between nitrification and mineralization is soil carbon," says Dr. Allison Gill, lead author of the study, hinting at the immense complexity of soil biogeochemistry across space. But the pattern still shone through. Despite differences between locations, soil carbon still exerted significant influence on the relationship between nitrogen mineralization and nitrification at every site.

This pattern might give scientists, policymakers, and managers a starting point when thinking about global problems such as nutrient pollution or carbon storage in soil. For example, increasing soil carbon—an oft touted carbon offsetting strategy—may uncouple nitrification and mineralization in some systems, reducing nitrification rates. Nitrification is a major source of nitrous oxide emissions, a greenhouse gas three hundred times more potent than carbon dioxide. "What we're showing is that [carbon] has a very direct impact on nitrogen transformations and potentially nitrogen availability in soils, as well as retention and loss," says Dr. Gill.



Photo by Ashley Keiser

A soil core from the Kellogg Biological Station LTER. Biogeochemical data from cores across the LTER network allowed researchers to study the link between the carbon and nitrogen cycles in this synthesis project.

LTER events have synthesis in mind

Data are, of course, essential to broad scale synthesis projects such as this one; fortunately, the LTER Network maintains publicly available, high quality datasets in spades. More difficult, however, is collecting the expertise required to meld different datasets from unrelated projects across diverse sites to explore patterns and uncover meaningful relationships.

For this project, Dr. Gill and her colleague Dr. Ashley Keiser convened a workshop at the 2018 LTER All Scientists' Meeting designed to bring experts from across the network together to explore their hypothesis. "The first step was using the workshop at the All Scientists meeting as a

launching point for saying, well, do any patterns exist at other sites?," says Dr. Keiser.

The back and forth between experts in the workshop was a crucial step towards the final paper. "At the [start of the] meeting, we were still making our comparisons within specific sites," says Dr. Keiser, noting that the initial idea was to compare patterns between individual treatments within specific sites rather than comparing patterns between ecosystems. "We realized quickly that trying to take a broader approach would be a much better scale for this work," adds Dr. Gill. "The feedback that we got in discussions in the workshop really helped push us in that direction."

A clear hypothesis begets successful synthesis

Drs. Gill and Keiser ascribe the success of their All Scientists' Meeting workshop and, ultimately, the whole project, to having a really clear hypothesis from the outset. "We had a very specific question," says Dr. Gill. "It was hypothesis-driven science."

That hypothesis, that soil carbon controls nitrogen mineralization and nitrification rates, emerged from a site-specific study at the Coweeta LTER. Dr. Keiser led the Coweeta study, where she and coauthors explored the biogeochemical differences between disturbed and undisturbed forest plots. The carbon-nitrogen link was the strongest relationship among a variety of variables they examined. The theory behind the phenomena hinted that carbon might influence mineralization and nitrification coupling in other ecosystems beyond Coweeta, says Dr. Keiser. "This link between carbon and nitrogen comes down to organismal demand for certain nutrients," says Dr. Keiser, competition that is not specific to Coweeta but present in all ecosystems. The next step was to see if the same pattern was detectable anywhere else.

Scaling up

This process underscores the strength of the LTER Network's structure. Exploratory studies such as the Coweeta example allow researchers to explore myriad factors in a specific ecosystem—"fishing," as Dr. Gill calls it, for new patterns or processes. LTER sites are somewhat autonomous, with latitude to explore patterns and processes relevant to each specific site—greatly increasing their chance of novel discovery.

Yet as part of the LTER Network, sites also must conduct research in certain core areas—research foci designed to facilitate comparison across sites. Plus, LTER sites are part of a network that encourages and actively facilitates conversations across sites. The LTER Network holds science focused network events such as the triennial All Scientists' Meeting, the annual Science Council Meeting, and regular webinar series, that are designed to keep researchers in conversation with each other and up to speed on trends, techniques, and findings across the network.

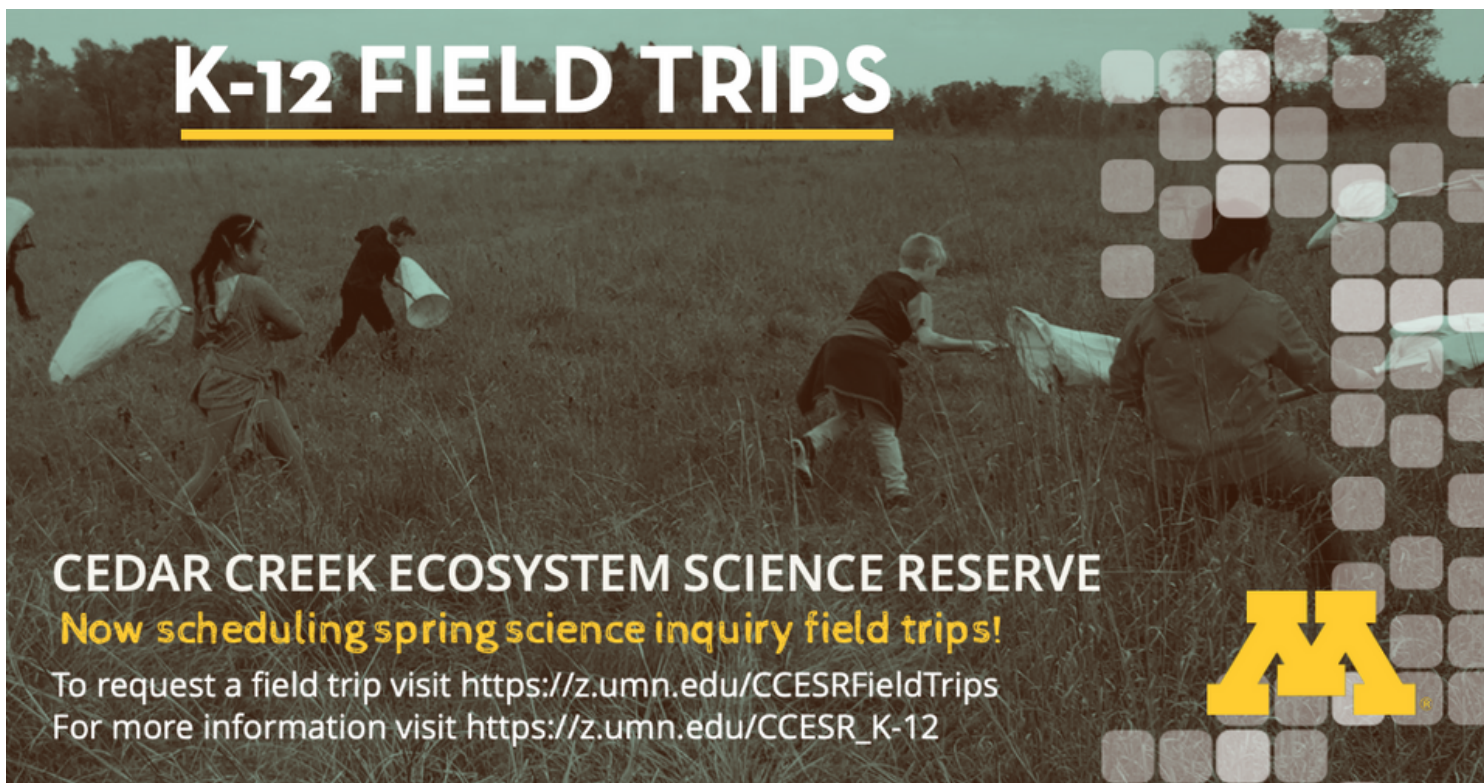
The result of these initiatives is coordination across sites that allows researchers such as Drs. Gill and Keiser to develop and test hypotheses that span multiple ecosystems. "The outcomes from cross-site synthesis highlight the value of publicly available data for exploring ecological patterns across scales and ecosystems as well as the value of partnering with scientists across the Network. In our All Scientists Meeting workshop, we quickly realized that we needed to significantly narrow our study question, and in doing so, were able to tell a really great story." says Dr. Keiser of her experience with LTER synthesis. "Now, we can use the pattern demonstrated at a large scale to ask new questions that peel back more layers."



Photo by Ashley Keiser

Sieving soil for the experiment at the Coweeta LTER that led Drs. Gill and Keiser towards the hypothesis that formed the backbone of this synthesis project.

Schedule your 2023 field trip!




K-12 FIELD TRIPS

CEDAR CREEK ECOSYSTEM SCIENCE RESERVE

Now scheduling spring science inquiry field trips!

To request a field trip visit <https://z.umn.edu/CCESRFieldTrips>
For more information visit https://z.umn.edu/CCESR_K-12



Now scheduling Spring and Fall 2023 Field Trips to Cedar Creek!

See science in action at Cedar Creek Ecosystem Science Reserve! Cedar Creek contains all three biomes found in Minnesota; students can be immersed in ecosystem comparisons of prairies, coniferous forests, and deciduous forests. With approximately two hundred scientific experiments occurring on site each year, students can witness the process of science through large-scale ecological research sites. All field trips incorporate elements of phenomenon-based learning through hands-on, inquiry-forward, activities.

From insects and ecosystems to snow science, we have many field trips that will connect with your classroom content. Visit our website for program offerings based on grade: https://z.umn.edu/CCESR_K-12. You can also reach out to the Education and Community Engagement Coordinator, Kara Baldwin (baldwink@umn.edu), and she will work with you to create a program that fits within your learning goals and objectives.

2023 Lunch with a Scientist - Spring Transitions

Hello Spring! It is the season of transitions, snow melting, buds bursting, and flowers blooming. We are also excited to transition to our hybrid format for Lunch with a Scientist programs starting in April. We will still have our webinar for those who would like to attend online (see below for more information on how to register), but will also have a live speaker at Cedar Creek Ecosystem Science Reserve. Those attending in person do not need to register.

To continue with our spring transitions, we will be moving away from Eventbrite platform and back to Zoom webinar registration for online Lunch with a Scientist programs. To register online visit <https://z.umn.edu/LWAS> or visit our website, <https://cbs.umn.edu/cedarcreek/public-programs/lunch-scientist>

The Lunch with a Scientist Lecture Series is free to the public. Please consider making a suggested donation of \$5-10 if you are able to. Donations go toward the Cedar Creek Fund which supports education and community programs at Cedar Creek, including science field trips, public events, and other education initiatives. We are grateful for donations of any amount and they do make a difference. Donating only takes a few moments, and your tax-deductible gift can be done completely online at <https://z.umn.edu/cedarcreefund>.



NATÁLIA KOCH

04.11.23
11:30 AM - 1:00 PM
Z.UMN.EDU/LWAS

**LICHENS:
ENVIRONMENTAL
INDICATORS**

April 2023 Lunch with a Scientist

Lichens are a fascinating example of symbiosis in ecology. In lichens, algae and fungi support each other to survive in unique habitats and locations. Lichens also can inform scientists about environmental quality and climate change. Join us for April's Lunch with a Scientist when we host Dr. Natália Koch as she describes the unique characteristics of lichens but also their utility in science as environmental indicators.

About the Scientist

Dr. Natália Koch's research focuses on community ecology, functional traits, and biomonitoring with an emphasis on lichens. She explores the relationships of different lichen species and traits with environmental changes and how these traits can be used to monitor changes. She earned her PhD in Ecology from the Universidade Federal do Rio Grande do Sul and currently is a postdoctoral researcher at the U of MN exploring the patterns of ecophysiological functional traits of lichen symbioses related to human-caused environmental changes. You can learn more about Natália's research through her research gate webpage and can follow her on Twitter and Instagram via @natimkoch.

2023 Lunch with a Scientist



May: Noxious Weeds in Anoka County

Some non-native species can have lasting impacts on public and private lands as they have a survival advantage, can out-compete native species and can take over landscapes. These problematic species, noxious weeds, need to be managed to restore habitat and ecosystem functions. The May Lunch with a Scientist is pleased to welcome Carrie Taylor to discuss invasive species in Anoka County as well as methods for controlling invasive species.

About the Scientist

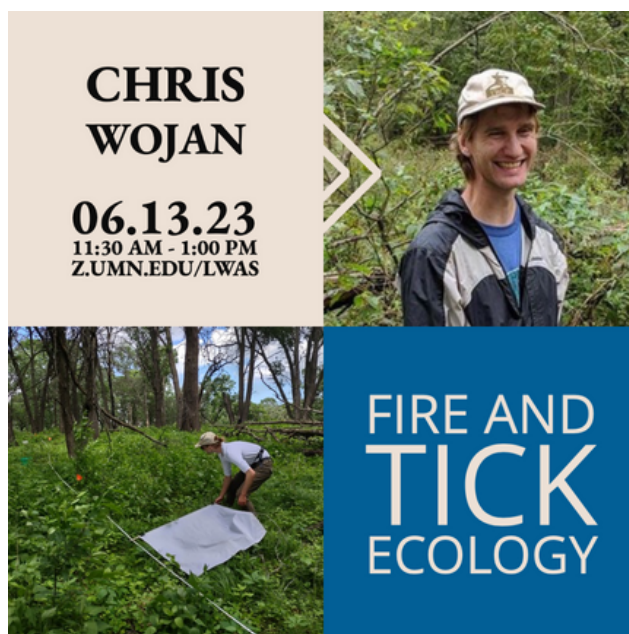
Carrie Taylor is a restoration ecologist at the Anoka County Conservation District. She holds a Bachelor's degree in Geological Sciences from Indiana University and a Master's degree in Land Rehabilitation from Montana State University. Carrie is responsible for natural resource monitoring, inventory, assessments and planning. She also facilitates the Anoka Cooperative Weed Management Area and coordinates and implements ecological restoration projects, including at Cedar Creek.

June: Fire and Tick Ecology

Program description coming soon.

About the Scientist

Chris Wojan is a PhD student in the Ecology, Evolution, and Behavior Program at the University of Minnesota, where he studies the ecology of parasites - particularly ticks. Prior to starting at UMN, Chris earned an MS at New Mexico State University studying the dispersal of brush mice, and then worked as a field researcher for various organizations, including the Jornada Experimental Range, the National Ecological Observatory Network, and Indiana University.



2023 Lunch with a Scientist

July 2023 Lunch with a Scientist

Our ability to infer about tree communities and their ecological processes rely on our capacity to observe them. Our Lunch with a Scientist lecture for July will focus on integrating remote sensing technologies with ecological experiments to better observe and infer about structural and chemical changes associated with forest communities. This lecture dives deep into how drones are used to monitor the Forests and Biodiversity (FAB) experiments at the Cedar Creek Ecosystem Science Reserve and the ecological understanding we are gaining by doing so.



About the Scientist

J. Antonio Guzmán Q. received his Ph.D. in Earth and Atmospheric Sciences from the University of Alberta, Canada in 2021. His dissertation focused on integrating novel remote sensing techniques to evaluate the variability, presence, and contribution of lianas and trees in the Tropical Dry Forests. Shortly after his Ph.D. convocation, Antonio started to work as Postdoctoral Associate in the ASCEND institute (Advancing Spectral biology in Changing Environments to understand Diversity) at the University of Minnesota. His research currently focuses on using remote sensing to quantify elements of tree communities (e.g., species, structure, chemistry) and their processes (e.g., diseases) across space and time.

Get ready for summer!

Like many of you, we're dreaming about the warm weather and vibrant summer colors while watching the latest round of snow come down outside. We're planning for our regular summer oak savanna programming and hope you'll join us!

Oak Savanna Birdwatching Walks



Join guides from the Red-headed Woodpecker Recovery Project to go birding in Cedar Creek's oak savannas! Meet your leader at the Fish Lake Nature Trail parking lot off Durant Street in East Bethel (z.umn.edu/fishlake).

Free, though donations to the project are appreciated.

Thursday, May 18: 6:30 PM

Saturday, June 3: 8:00 AM

Thursday, June 15: 6:30 PM

Saturday, July 8: 8:00 AM

Thursday, July 20: 6:30 PM

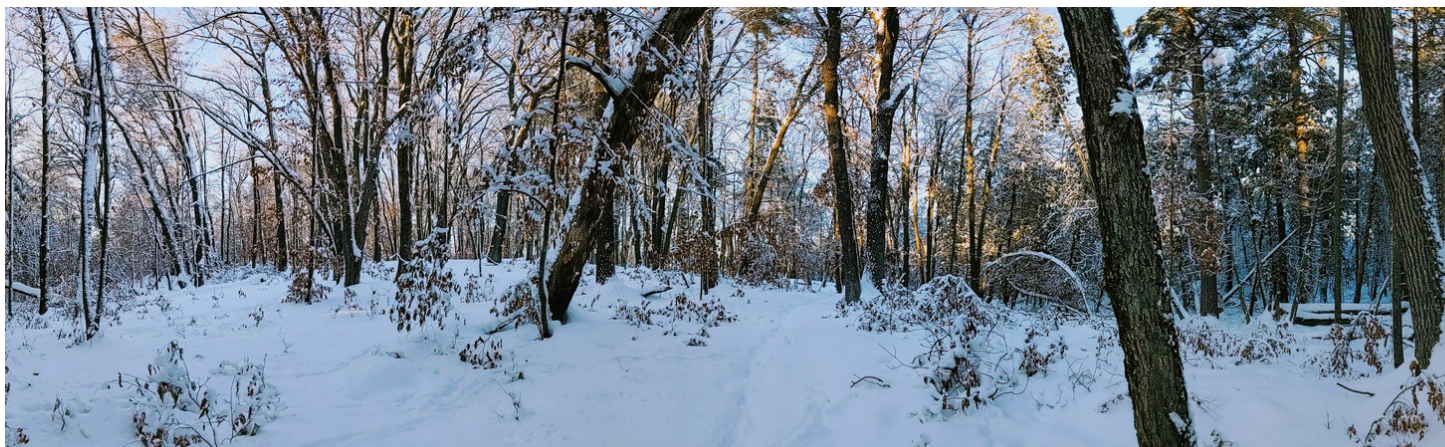
Bison Gazebo - staffed and self-guided options

The oak savanna extension trail and the bison gazebo will be open again this summer! While the specific opening and closing dates are still to be determined, we anticipate that the trail will be available for self-guided walks by late May (after prescribed burning is completed, and the bison herd returns for the summer).

The bison gazebo will be staffed by volunteers with information, artifacts, binoculars and activities on Saturdays from 10am-4pm, starting June 3rd. Come out and visit! The savanna is beautiful and lively, whether or not the bison are visible.



Caught on Camera!



A snowy afternoon in the deciduous forest



Students from St. Francis Schools return from a snowshoeing adventure



Permanent staff went through their biennial CPR and first aid training



After multiple weather-related reschedules, the ed team was thrilled to welcome students from Howard Lake-Waverly-Winstead Middle School for a wintery field trip!



Wildlife tracking volunteers investigate a set of coyote tracks

Caught on Camera!



Phenology! The first gophers of 2023 were spotted March 28th

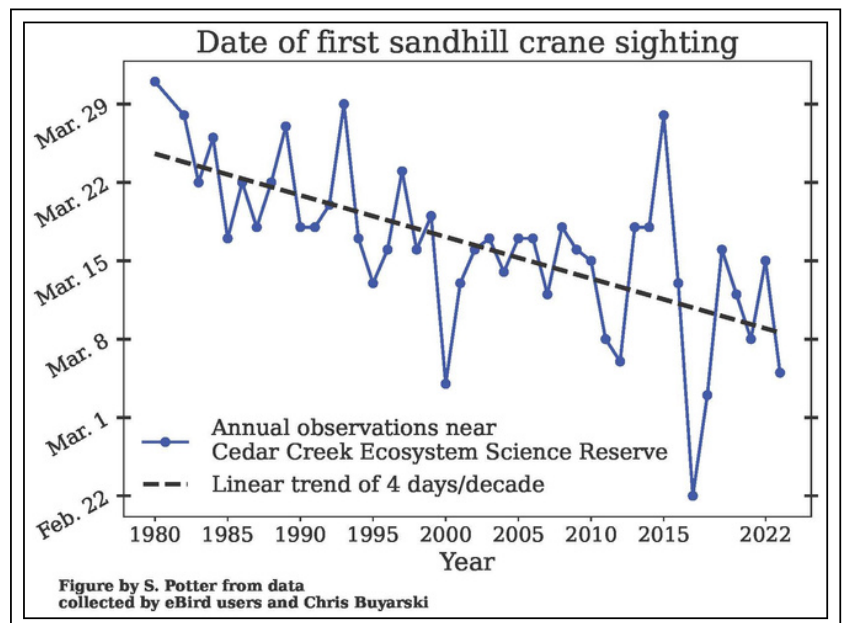


Photo by Mark Saxhaug

The "road" to the Icon House, completely drifted shut after a February blizzard



2022 biomass and soil samples are still being processed



More phenology! Sandhill cranes returned a couple of days before their predicted arrival, allowing us to update this cool long-term graph

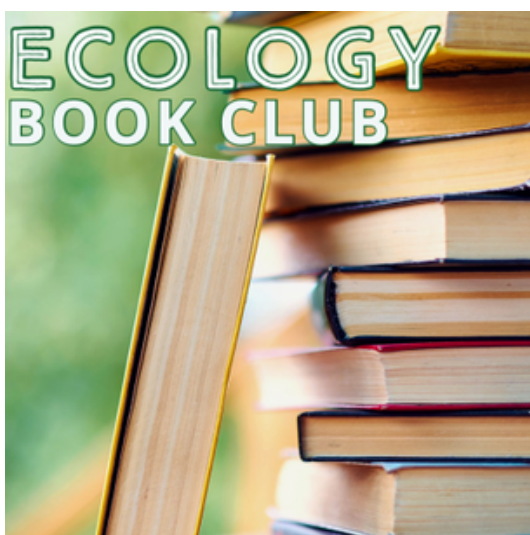
Upcoming Events



April 11: Lunch with a Scientist: Lichens as Environmental Indicators: 11:30 AM - 1:00 PM

Lichens are a fascinating example of symbiosis in ecology. In lichens, algae and fungi support each other to survive in unique habitats and locations. Lichens also can inform scientists about environmental quality and climate change. Join us for April's Lunch with a Scientist when we host Dr. Natália Koch as she describes the unique characteristics of lichens but also their utility in science as environmental indicators.

April's Lunch with a Scientist program is hybrid, join us online or in person at Cedar Creek. Visit our Lunch with a Scientist page (<https://cbs.umn.edu/cedarcreek/public-programs/lunch-scientist>) for details.



April 26: Ecology Book Club (Online): The Wild Life of Our Bodies: 6:30 PM

Are you interested in our impact on planet earth? The web of life? Climate change? Nature? Ecology? If so, this book club is the place for you. Join us as we continue our journey of lifelong learning. The Ecology Book Club meets online at 6:30 PM on Zoom. Register at <http://z.umn.edu/bookclubonline>.

April's Book: *The Wild Life of Our Bodies: Predators, Parasites, and Partners That Shape Who We Are Today* by Dr. Rob Dunn

NOTE: Books are selected by the club members, and no scientific expertise or background is necessary to participate. You don't even need to have finished the book!



April 28: Spring Constellations & Star Party: 7:00 PM

Come and learn more about the night skies in Spring. Minnesota Astronomical Society members will walk you through the April skies. After the short presentation, a number of telescopes will be available for night sky viewing after the program, weather dependent.

NOTE: You do not need a telescope to attend.

Star Parties are scheduled on Friday nights, with a backup date of Saturday, if the weather is better. Please check the Minnesota Astronomical Society - Cedar Creek webpage to stay up to date on the start time and if the Star Party is occurring on Friday, April 28, or Saturday, April 29. You do not need to register for this event.

Upcoming Events



May 9: Lunch with a Scientist: Noxious Weeds in Anoka County: 11:30 AM - 1:00 PM

Some non-native species can have lasting impacts on public and private lands as they have a survival advantage and can out-compete native species, and take over landscapes. These problematic species, noxious weeds, need to be managed to restore habitat and ecosystem functions. The May Lunch with a Scientist is pleased to welcome Carrie Taylor to discuss invasive species in Anoka County as well as methods for controlling invasive species.



May 16: Land Management: Garlic Mustard Pull: 9:00 - 11:00 AM

We are excited to partner with Anoka County to remove invasive species within Cedar Creek. On Tuesday, May 16, from 9:00 -11:00 AM, join us for a Garlic Mustard Pull to remove an invasive Garlic Mustard patch from the interior of Cedar Creek property. Bring yourself, bug spray, water bottle, long pants and hiking boots as we walk to the site from the main building, Lindeman Lab. Learn more about how to identify and remove garlic mustard. Tools, gardening gloves, and other supplies will be provided. If you'd like, bring a sack lunch and enjoy eating it out on the patio by Lindeman Lab after the event.



May 12: What's up Tonight & Star Party: 8:00 PM

Come and learn more about the night sky! Minnesota Astronomical Society members will walk you through interesting things occurring in the night skies in May. After the short presentation, a number of telescopes will be available for night sky viewing after the program, weather dependent.

NOTE: You do not need a telescope to attend.

Star Parties are scheduled on Friday nights, with a backup date of Saturday, if the weather is better. Please check the Minnesota Astronomical Society Cedar Creek webpage to stay up to date on the start time and if the Star Party is occurring on Friday, May 12, or Saturday, May 13. You do not need to register for this event.

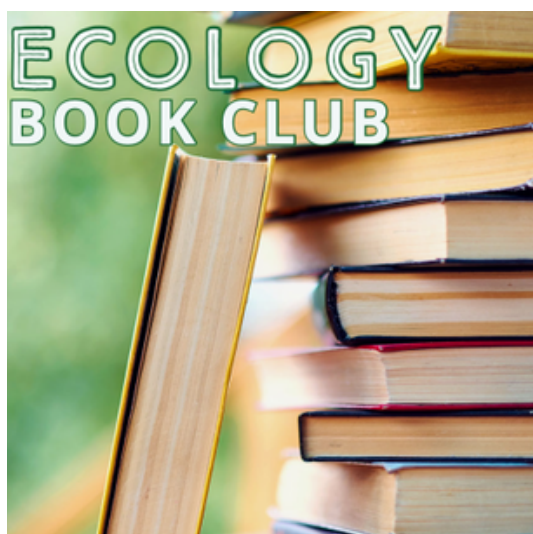
Upcoming Events



May 18: Oak Savanna Bird Walk: 6:30 PM (meet at Fish Lake)

Join guides from the Red-headed Woodpecker Recovery Project to go birding in Cedar Creek's oak savannas! Meet your leader at the Fish Lake Nature Trail parking lot off Durant Street in East Bethel (z.umn.edu/fishlake). Come prepared to walk, slowly, on dirt and sand roads for 90-120 minutes. Bring binoculars if you have them!

Free and no registration required, though donations to the project are appreciated. Walk will be cancelled in the event of bad weather.



May 24: Ecology Book Club (Online): Summer World: 6:30 PM

Are you interested in our impact on planet earth? The web of life? Climate change? Nature? Ecology? If so, this book club is the place for you. Join us as we continue our journey of lifelong learning. The Ecology Book Club meets online at 6:30 PM on Zoom. Register at <http://z.umn.edu/bookclubonline>.

May's Book Selection: *Summer World: A Season of Bounty* by Bernd Heinrich

NOTE: Books are selected by the club members, and no scientific expertise or background is necessary to participate. You don't even need to have finished the book!



June 3: Oak Savanna Bird Walk: 8AM (meet at Fish Lake)

Join guides from the Red-headed Woodpecker Recovery Project to go birding in Cedar Creek's oak savannas! Meet your leader at the Fish Lake Nature Trail parking lot off Durant Street in East Bethel (z.umn.edu/fishlake). Come prepared to walk, slowly, on dirt and sand roads for 90-120 minutes. Bring binoculars if you have them!

Free and no registration required, though donations to the project are appreciated. Walk will be cancelled in the event of bad weather.

Upcoming Events



June 3: Solar Viewing: Solar Energy: 1:00 - 3:00 PM

Cedar Creek is excited to offer our first ever Solar Viewing Party in partnership with the Minnesota Astronomical Society. Come to Cedar Creek to learn more about the sun and its importance to plants and life on Planet Earth. After family-friendly activities, experienced Minnesota Astronomical Society Members will use special telescopes and telescope filters for safe solar viewing.*

June's program will focus on the sun's solar energy and its impacts on animals and potential uses by humans. Activities are geared toward ages 6+. Registration is required. To register visit Eventbrite.

*NOTE: Looking directly at the sun without specialized equipment and filters can cause permanent eye damage.



June 13: Fire and Tick Ecology: 11:30 AM - 1:00 PM

Program description coming soon - graduate student Chris Wojan will discuss new research looking at tick abundance and distribute across Cedar Creek's fire frequency experiment! June's Lunch with a Scientist program is hybrid, join us online or in person at Cedar Creek. Visit our Lunch with a Scientist page (<https://cbs.umn.edu/cedarcreek/public-programs/lunch-scientist>) for details.



June 15: Oak Savanna Bird Walk: 6:30PM (meet at Fish Lake)

Join guides from the Red-headed Woodpecker Recovery Project to go birding in Cedar Creek's oak savannas! Meet your leader at the Fish Lake Nature Trail parking lot off Durant Street in East Bethel (z.umn.edu/fishlake). Come prepared to walk, slowly, on dirt and sand roads for 90-120 minutes. Bring binoculars if you have them!

Free and no registration required, though donations to the project are appreciated. Walk will be cancelled in the event of bad weather.

Support Cedar Creek

From the 1940s and Raymond Lindeman's field-shaping insights to the present-day work of world-renowned ecologists, Cedar Creek Ecosystem Science Reserve is a highly influential field station, research destination and teaching laboratory. Our work plays a critical role in advancing our understanding of how we are affecting the environment and how we might protect it. Be part of this incredible legacy and bright future by supporting the field station.

Your gift can support any aspect of our mission!
Choose the category that speaks to you:



Research: Gifts to one of our named research funds supports undergraduates, graduate students, and faculty in a variety of ways. Your gift could be used to provide room and board support for a research internship participant, to purchase equipment for a student project, to enhance faculty collaborations, to support synthesis work, or in other ways that help advance the field of ecology.

Education and Community Engagement: Gifts to our E&CE funds provide field trip and transportation scholarships for K-12 students, support our artist in residence program, help provide supplies for our participatory science events, and allow us to offer stipends to guest teachers in our public programs.

Conservation: Gifts to the Cedar Creek Conservation Fund help us understand, manage and restore the species and ecosystems of the reserve. This includes supporting red-headed woodpecker and bison initiatives, invasive species management, and prescribed burning.

Capital Improvements: Gifts to the Cedar Creek Capital Improvements Fund support the development of infrastructure onsite. Current priorities include the Minnesota Ecology Walk and an addition to the Lindeman Center, both of which will enhance our ability to provide interpretive experiences for visitors.

General: The Cedar Creek Membership Fund provides general support to the areas of greatest need at Cedar Creek, to ensure community support, equipment and research.